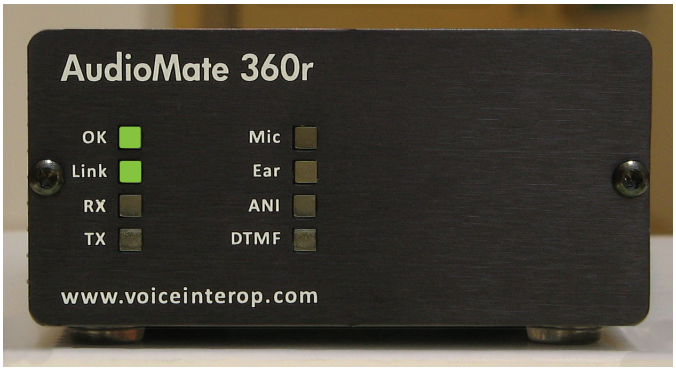
AM360r

AudioMate 360r User Manual

IP Voice Gateway for Land Mobile Radio



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OVERVIEW

Overview

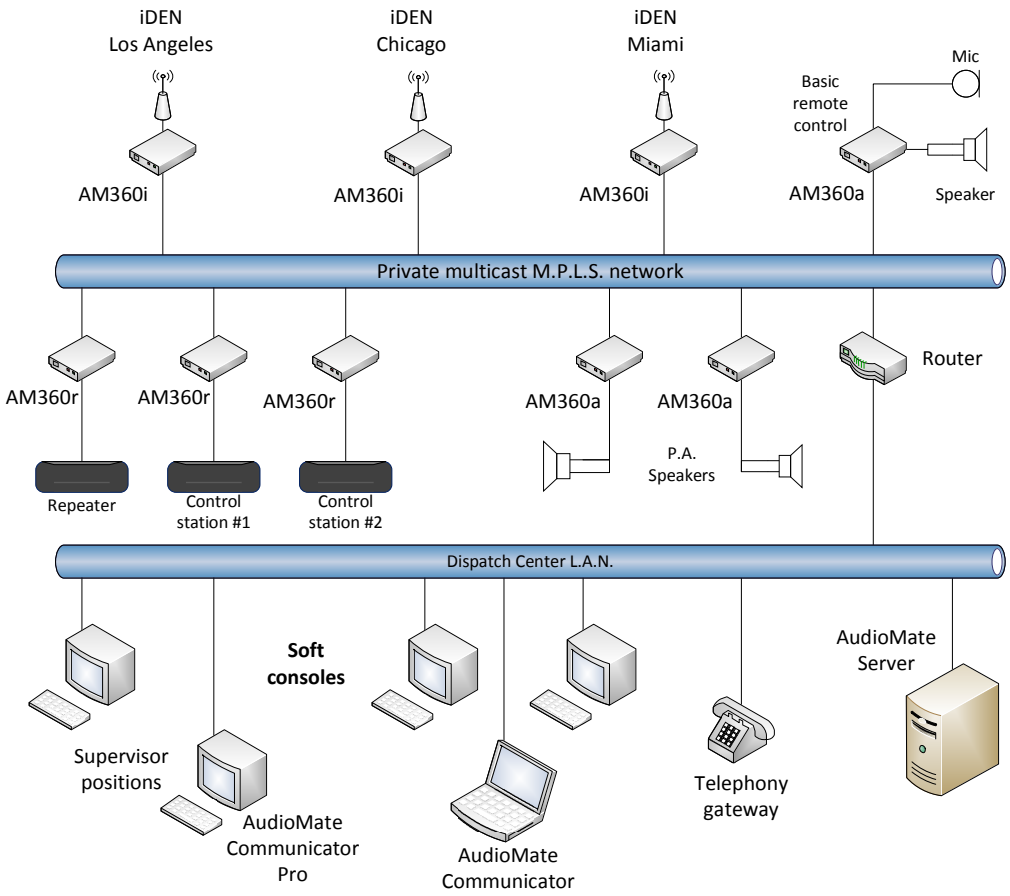
Voice Communications Via Your IP Network

The AudioMate 360 family of IP voice gateways links your IP network with a new world of voice communications possibilities. Now, disparate communications modes and equipment can interoperate as never before.

The AudioMate 360a interfaces with baseband audio devices such as microphones, public address amplifiers, broadcast receivers, and portable music players. The AudioMate 360i interfaces with iDEN PTT radio networks, while the AudioMate 360r interfaces with existing 2-way radio equipment such as repeaters and control stations.

The AudioMate 360r connects to a 2-way Land Mobile Radio via either a balanced Type 2 or 3 E&M port or single-ended control and audio connections. The other portion of the unit connects to your IP network using a standard 10/100BaseT LAN interface to provide the link to other IP voice gateways and soft consoles running on desktop and laptop PCs.

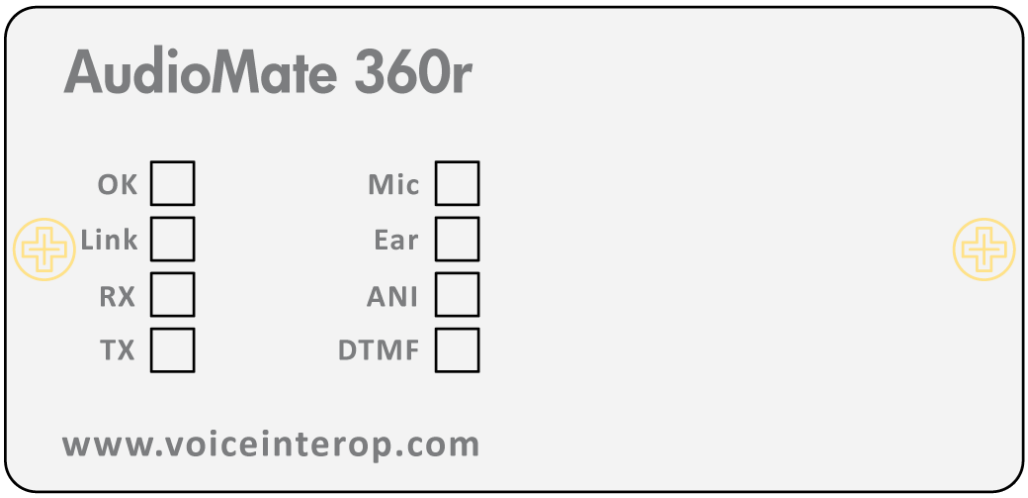
Once properly installed and configured, any AudioMate Communicator soft console on your LAN or WAN can transmit and receive over the radio attached to the AudioMate 360r IP voice gateway. The AudioMate Server can accept telephone calls, iDEN calls from an AudioMate 360i, and other interoperating radio systems to form a huge conference of disparate modes of communications.



TOUR

AudioMate 360r Product Tour

Front Panel



Front Panel Indicators

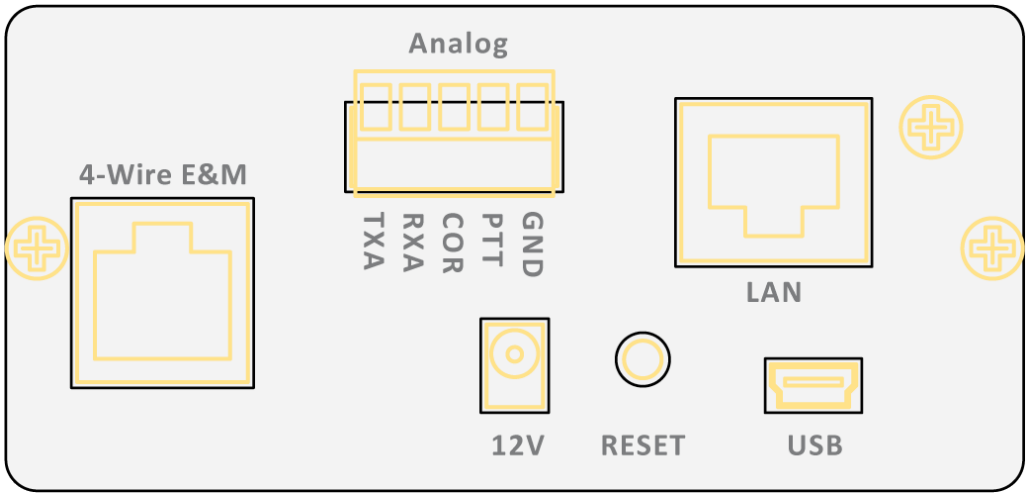
All front panel indicator LEDs can display one of seven color states: OFF, RED, RED FLASHING, GREEN, GREEN FLASHING, AMBER and AMBER FLASHING each of which can be used to indicate a different condition within the AudioMate 360r.

LED	Amber	Amber flashing	Green	Green flashing	Red	Red flashing
OK	Booting, awaiting DHCP address	N/A	Normal operation	N/A	Boot error (view boot via USB serial port)	N/A
Link	N/A	N/A	Connected to AM360 server	N/A	N/A	Seeking AM360 server
Rx	Buffering audio from IP network	N/A	Playing rcvd RTP stream out radio port	N/A	N/A	N/A
Tx	N/A	N/A	N/A	N/A	Sending RTP stream to IP network	N/A
Mic	N/A	N/A	N/A	N/A	M-lead asserted	N/A
Ear	N/A	N/A	E-lead input is active	N/A	N/A	N/A
ANI	N/A	N/A	N/A	N/A	N/A	N/A
DTMF	N/A	N/A	N/A	N/A	N/A	N/A
ANI = Automatic Number Identification, used for PTT ID						

Front Panel Connections
There are no connections to the front panel of the AudioMate 36Ør.

Front Panel Controls
There are no controls on the front panel of the AudioMate 36Ør.

Rear Panel



Rear Panel Indicators
LAN Port — The LAN jack has two built-in lamps: a solid green one indicating that an electrical link has been established, the other flashing green indicating packet activity.

Rear Panel Connections
4-Wire E&M — This RJ-45 Type II or III E&M port provides a balanced 6ØØ ohm transformer-coupled audio connection to popular 2-way radios. There are multiple standards for connections to a radio using the RJ-45. The electrical specifications and pin assignments for the AudioMate 36Ør E&M connector are given in Appendix A, along with interface examples. Be careful not to connect an Ethernet cable to the E&M port, as they both employ RJ-45 jacks.

Analog — Allows connection of single-ended audio and control signals from popular 2-way radios via a screw terminal plug. This plug accepts stranded or solid wire. All signaling is single ended, referenced to ground. The pin assignments and electrical specifications for the AudioMate 36Ør Analog connector are given in Appendix A, along with interface examples.

LAN — Standard 1Ø/1ØØBaseT Ethernet port with pin-outs following the AT&T T568B specification. A standard Category 5 LAN cable connects it to an Ethernet switch. Be careful not to connect the E&M cable to the LAN port, as they both employ RJ-45 jacks.

USB — Allows a trained technician with a correctly setup computer to establish a direct serial connection to the AudioMate 36Ør internal Diagnostic Console. Connects via a standard USB A to Mini-B cable. The computer must have the Virtual Comm. Port driver from FTDI (`ftdichip.com`) installed along with any standard terminal emulator. This port is used for diagnostics; no voice parameters can be set.

12 V — 12 Volt d.c. input, tip is positive, ring is negative. The supplied power adapter converts 120 Volt a.c. main power to 12 Volts d.c. at 500 mAmps maximum. The power plug has a 1.3mm inner diameter.

Rear Panel Controls

Reset — This recessed push button reboots the processor in the AudioMate 360. Depress using a pen or any device with a small tip. The length of time that it is held depressed determines the type of reset:

Quick Reset – A momentary press performs a simple reset.

Factory Reset – Press and hold until OK light goes from AMBER to GREEN to reset those options found on the web configuration screens to factory defaults. While the AudioMate 360 is awaiting an address from a DHCP server this could take as much as 60 seconds. In order to ensure that the device loads factory default settings the Reset button must be held this entire time, until the OK light changes from AMBER.

INSTALLATION

Installation

Network Considerations

In the typical AudioMate installation all endpoints are contained entirely in a corporate LAN, or participate via a WAN link, either unicast through a VPN or an engineered MPLS network, for example. It is preferable that all routers serving network segments that connect AudioMate endpoints be configured to route multicast streams. This can smooth implementation of multicast systems in general, and the deployment of AudioMate Communicator remote control soft consoles in particular.

Multicast is used to allow multiple endpoints to share one stream of audio packets, thus reducing bandwidth consumption. However, while multicast streams typically pass seamlessly through Ethernet switches, they are typically blocked by most routers unless proper preparations are made to accommodate multicast. It is a near certainty that multicast streams will not flow through most Internet routers. Therefore, unicast addresses are acceptable for use in the AudioMate 360 line of IP gateways.

Bandwidth Consumption and CoDecs

The G.711 codec (encoder/decoder algorithm) consumes approximately 84kilobits/second per stream. More aggressive codecs consume less bandwidth, but their output audio is typically of lower quality. Some codecs perform poorly in environments with high acoustic noise near the microphone. Narrowband IP links might require a more aggressive codec, while endpoints on your LAN will likely do well with the G.711 codec. Because the AudioMate Media Server can perform transcoding between coding algorithms you have the opportunity to optimize bandwidth usage versus audio quality.

Electrical Considerations

The AudioMate 360 gateways are powered by 12 Volts d.c. which can be provided by the provided plug-in power supply or by a 12 Volt battery with float charging system. In either case, the power must be clean and free of a.c. noise components and interruptions. The supplied power module should be plugged into an uninterruptible power supply (UPS) for trouble-free service. If a 12 Volt battery/charger system is used, the charger must keep noise to less than 12mVp-p.

CONFIG

Configuration

Individual AudioMate 360 units are configured via web browser pointed to the management address of the unit. The units are shipped with DHCP enabled and will accept whatever address is assigned by your DHCP server, within approximately 60 seconds after power-up. Failing that, the units will default to an IP address of **`192.168.0.254`** after timing out. Use the AudioMate 360 address finder utility to locate the addresses of your units in preparation for configuration.

AudioMate 360

The Address Finder utility is available at our web site:

www.voiceinterop.com

Each unit requires two groups of configuration data: one group that is common across the AudioMate 360 family and a second group that is specific to the personality module of the unit.

Log In

Type the address of the AudioMate 360 unit under test into the address bar of your web browser. (At the time of this writing the freely available Mozilla Firefox web browser provides smoother operation for these purposes.) If a name had been previously assigned to this particular AudioMate 360 unit it will appear in the title bar of the web browser to assist in identifying it. At the prompt, for user name type **`admin`** and for password type the word **`password`**.

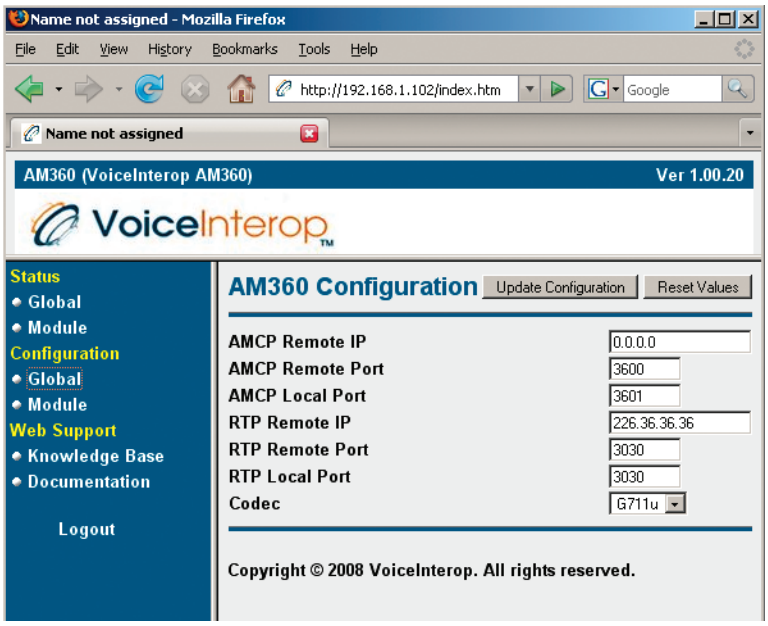
AudioMate 360

username = admin

password = password

If your credentials were accepted you will see a two part screen with a menu panel on the left pane and a page labeled **AM360 Status** on the right pane.

Global Configuration



In the menu pane on the left, locate the **Configuration** heading and click the link **Global** under it. The screen labeled **AM360 Configuration** should appear in the right pane.

You may safely ignore the **AMCP** settings.

RTP Remote IP
is relative to this unit, the one that you are configuring.

Appendix B
has more detail on selecting multicast addresses with pointers to reference sources.

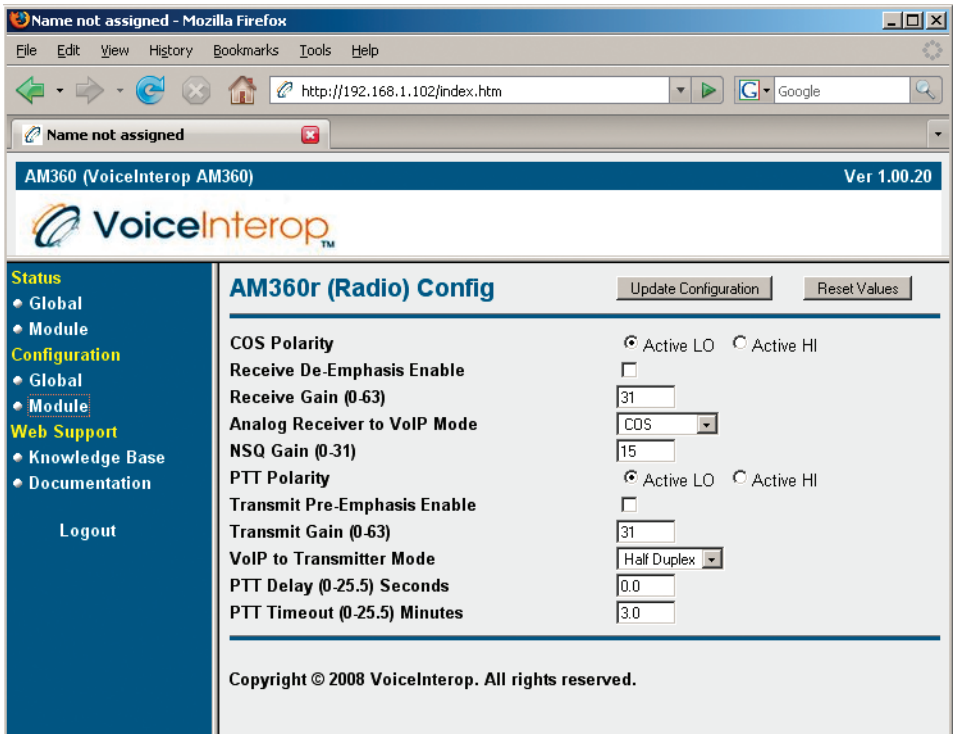
RTP Remote IP is the multicast group or unicast address of the **other** end of the link, not this unit. This might be a WAVE media server or another AM360. The Class D multicast range lies between `225.0.0.0` and `239.255.255.255` with numerous restrictions and considerations. A unicast address should fall within your LAN's private IP address space. Consult Appendix B for more information on multicast address assignment.

RTP Remote Port is the IP port number assigned to this channel. This should be an even number between `16384` and `65534`.

RTP Local Port should be identical to the **RTP Remote Port** number.

Codec should be set to **G711u** for most applications. Other choices are **G711a** for G.711 A-law, and **GSM** for GSM 6.1 full rate.

When you are satisfied with all the settings that appear on the **Global Configuration** page, be sure to click on the button labeled **Update Configuration** at the top of the page. Your new settings take effect immediately. To revert back to the previously saved values while editing click the button labeled **Reset Values** at the top of the page.



Personality Module Configuration

In the menu pane on the left, locate the **Configuration** heading and click the link **Module** under it. The screen labeled **AM360r (Radio) Config** should appear in the right pane.

COS Polarity sets the AudioMate 360r unit to begin streaming audio to the IP network when the COS input is held either low (approximately 0 Volts) or high (3-12 Volts). Consult your radio documentation to determine the proper setting.

Receive De-Emphasis Enable will apply a 6dB per octave roll-off of high frequencies; this is effectively a low-pass filter using an industry standard curve in cases where the audio input to the AudioMate 360r is connected to the discriminator output of a conventional radio. Check this box to enable the de-emphasis low-pass filter or clear the check box to allow the receive audio to pass through the AudioMate 360 with no equalization (flat audio).

Receive Gain accepts a number from 0 to 63 representing 64 steps of gain or attenuation in the audio line from the attached radio receiver to the IP network. Level 0 represents the lowest audio level while 63 represents the highest audio level.

Analog Receiver to VoIP Mode drop-down listbox determines the triggering mechanism that will begin the stream from the radio receiver to the IP network.

OFF prevents any receive audio from being streamed to the IP network.

COS (Carrier-Operated Switch) will stream audio to the IP network when the COS digital input is asserted, either on the Single-Ended COS logic line or the M-lead of the E&M interface.

NSQ (Noise Squelch) is only useful when the receive audio input of the AudioMate 360r is connected to the radio receiver's unsquelched discriminator source in a conventional radio. The AudioMate 360r will determine the presence of received signal based on the reduction in white noise from the radio. If this setting is selected, then the NSQ Gain setting must also be configured for proper operation.

COS+NSQ (AND Squelch) computes the Boolean logic value of the COS AND NSQ. That is, if the COS digital input is asserted and the NSQ detector is also active, then the AudioMate 360r will stream receive audio to the IP network. The most common application for this setting would be to use the noise squelch detector to ascertain that an intelligible signal is present at the radio receiver while the COS input is connected to a coded squelch detector (PL or DPL) to block out all but the desired users on the channel. This is commonly referred to as "AND Squelch".

ON activates the receive audio stream at all times, even when there is no receive audio to send. This setting can interfere with proper operation of channel patches, therefore its use is discouraged.

NSQ Gain sets the squelch level provided by the AudioMate 360r when the receive audio input is connected to the discriminator output of a conventional radio. This setting is only useful when **NSQ** or **COS+NSQ** is selected in **Analog Receiver to VoIP Mode** above. It is also likely that you will want to check the box for **Receive De-Emphasis Enable** as well.

PTT Polarity sets the logic level that will be applied to the PTT digital output in order to key the attached radio transmitter. For radios requiring an active low or ground signal on their PTT lines, select **Active LO**. For other types of keying circuits select **Active HI**. Consult your radio technical manual to determine the proper setting.

Transmit Pre-Emphasis Enable will apply a 6 dB per octave high pass filter to the transmit audio stream from the IP network to the transmitter audio of the attached radio. Check the box to apply this filter or clear the check box to allow the transmitted audio to pass unprocessed (flat audio). In general, if the transmit audio line of the AudioMate 360r is connected to the microphone input of the attached radio, then leave this check box

cleared. If the audio is fed directly to the FM modulator of the radio, this check box should be checked to enable pre-emphasis.

Transmit Gain accepts a number from 0 to 63 representing 64 steps of attenuation or gain in the audio path from the IP network to the attached radio transmitter. Level 0 represents the lowest audio level while 63 represents the highest audio level. Follow the procedure specified in your radio's technical manual to set this to an acceptable level.

VoIP to Transmitter Mode determines whether the AudioMate 360r will allow two-way audio flow or prohibit transmission entirely.

OFF disables the AudioMate 360r from keying the attached radio transmitter. Use to prohibit transmission entirely in listen-only applications where the radio should never be keyed under any circumstances.

Half Duplex allows transmission over the attached radio, but will not stream receive audio during transmission. Select this when attached to a control station radio.

Full Duplex allows transmission over the attached radio while simultaneously sending receive audio back to the IP network. Select this when attached to a full-duplex repeater station.

ON keys the attached radio transmitter full-time regardless of the signals from the IP network.

PTT Delay (Hang Time) sets the time period between the end of the IP network stream and the release of the PTT signal by the AudioMate 360r. This can be useful if the radio unkeys before all the audio has finished playing out of the buffer. Acceptable values for PTT Delay range from 0 to 25.5 seconds in increments of 0.1 seconds.

PTT Timeout sets the maximum duration of a transmission to prevent the attached radio from typing up the channel, such as an stuck footswitch on a console on the IP network. Acceptable values for PTT Timeout range from 0 minutes to 25.5 minutes. Typically this value is set between 1 and 3 minutes for practical applications.

When you are satisfied with all the settings that appear on the **Module Configuration** page, be sure to click on the button labeled **Update Configuration** at the top of the page. Your new settings take effect immediately. To revert back to the previously saved values while editing click the button labeled **Reset Values** at the top of the page.

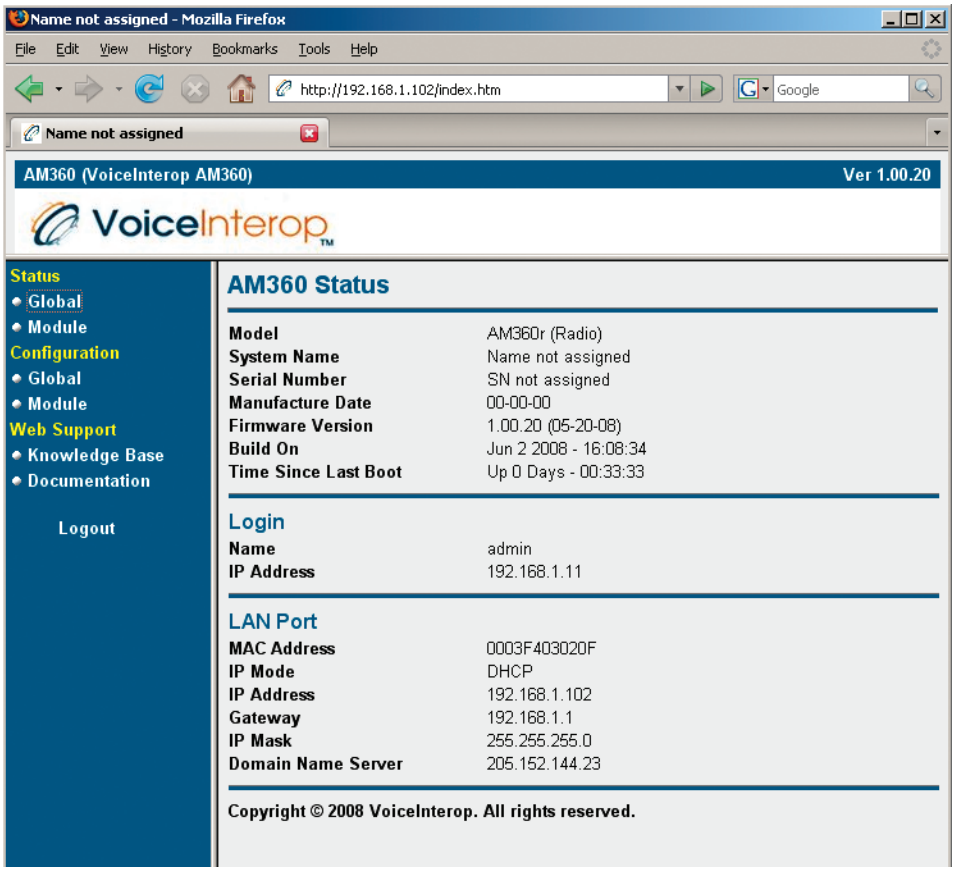
STATUS

Status

The AudioMate 360 family of IP gateways provide status reports to make adjustments and diagnostics easier.

The AudioMate 360r provides the means to view the status of the digital input and output signals as well as to view the current settings of the transmit and receive audio levels.

Global Status



The Global Status page displays various parameters of the common interface board.

In the menu pane on the left, locate the **Status** heading and click the link **Global** under it. The screen labeled **AM360 Status** should appear in the right pane.

Some noteworthy fields:

Model shows the particular type of AudioMate 360 unit that you are managing.

System Name displays text that was stored to identify this unit or the system of which it is a part.

Serial Number uniquely identifies this unit.

Login

IP Address shows the address of YOUR computer from which you are managing this unit.

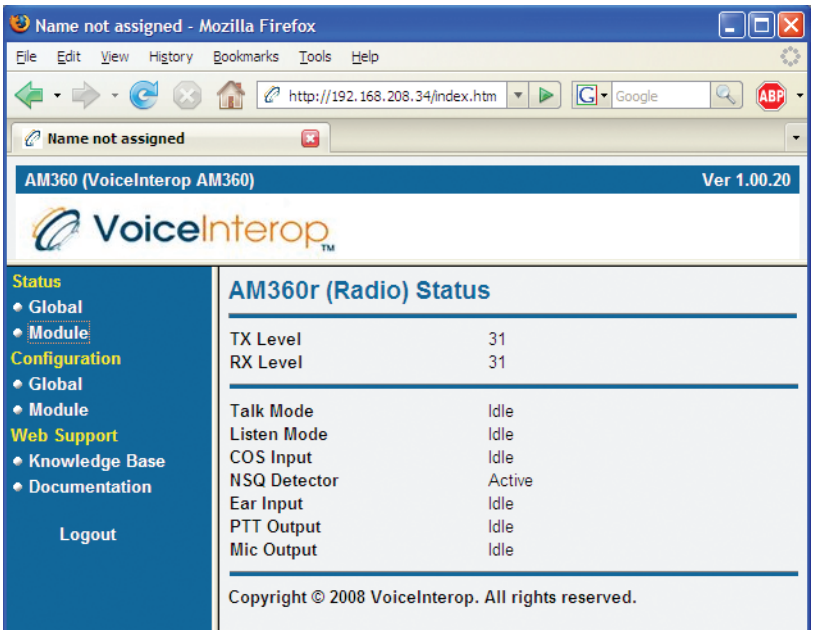
LAN Port

MAC Address shows the Ethernet address of the unit's LAN interface. This uniquely identifies the unit on your network and can be useful in differentiating among several AudioMate 360 units on the same network.

IP Mode shows whether the unit received its address from a DHCP server or is configured with a static IP address.

IP Address shows the currently assigned IP address regardless of how it was obtained.

Module Status



The Module Status page displays the audio level settings and the state of the various digital inputs and outputs. Refresh the page to see the current states.

In the menu pane on the left, locate the **Status** heading and click the link **Module** under it. The screen labeled **AM360r (Radio) Status** should appear in the right pane.

TX Level and **RX Level** indicate the current setting of the transmit and receive audio levels. These can be changed in the **Module Configuration** screen.

Talk Mode when **Active** indicates that voice packets are being streamed to the LAN port. This can be triggered by the COS input or by setting **Analog Receiver to VoIP Mode** to **ON** to force full-time streaming.

Listen Mode when **Active** indicates that the LAN port is receiving voice packets addressed to this unit.

COS Input indicates that the state of this digital input line is currently at the **Active** level, whether defined to be high or low. In a properly configured system this would go active when the attached radio's receiver is receiving a signal.

NSQ Detector indicates whether the unit's built-in noise squelch detector is receiving enough discriminator noise to turn off the path from the receive audio input to the LAN port. Less noise means more signal which in turn means that this indicator will show Active. In most configurations this will always indicate **Active** since there is no high frequency noise for the detector to decode.

Ear Input follows the state of the E-lead on the E&M port.

PTT Output indicates whether this digital output line is asserted, shown as **Key**, or whether it is idle. If troubleshooting and this indicates **Key** yet the attached radio does not transmit, check the wiring of the interface cable and whether the radio requires an active low or active high signal to key the transmitter.

Mic Output indicates the state of the M-lead on the E&M port.

SPECS

AudioMate 360r Specifications

Physical	
Form factor	Stand-alone unit
Dimensions	1.75 in. (4.5 cm) H x 3.6 in. (9.2 cm) W x 5.2 in. (13.2 cm) D
Weight	0.8 pounds (0.4 kg)
Electrical	
Input Voltage	12 Volts d.c. nominal, 16 Volts d.c. MAX., 10 Volts d.c. min.
Input current	350 mAmps nominal
Audio Interface	
Line input, balanced	0 dBm nominal, +10 dBm MAX. @ 600 Ohms (E&M port)
Line input, single-ended	2.2 Volts peak-peak nominal, 5 Volts peak-peak MAX. @ 10K Ohms
Line output, balanced	0 dBm nominal, +10 dBm MAX. @ 600 Ohms (E&M port)
Line output, single-ended	2.2 Volts peak-peak nominal, 5 Volts peak-peak MAX. @ 100 Ohms
Digital I/O	
Outputs	PTT, 12 Volts @ 500 mAmp MAX., open drain; user-selectable active hi or low
Inputs	COS, high > 3 Volts (18 Volts MAX.); user-selectable active high or low
L.A.N.	10/100-BaseT Ethernet RJ-45 jack
Serial	USB-mini B diagnostic port
E&M	Type II (two) and Type III (three) E&M interface
Digital audio	
CoDecs	G.711 µ-law 64kbps, G.711 A-law 64kbps, GSM 6.10 (13kbps)
Environmental	
Operating temperature	0 to +40 Centigrade
Storage temperature	-20 to +60 Centigrade
Miscellaneous	
Indicators	Activity: OK, Link, Tx, Rx, Mic, Ear, ANI, DTMF
Features	Firmware upgrade over Ethernet; web browser configuration screens (no jumpers); telnet diagnostic output, USB diagnostic and basic configuration utility
Ports	4-wire E&M RJ-45; 5-pin inline for single-ended audio and digital i/o; LAN RJ-45; 12 Volt coaxial jack; USB-mini B for diagnostics

Specifications subject to change. Note hardware revision and firmware version of your particular unit when consulting specifications and instructions.

A

Appendix A - Interface Examples

Ritron Nexus Radio Base

The Ritron NRB is a small, lightweight radio available in VHF and UHF bands that is well-suited to demonstration use. It interfaces with the AudioMate 360r via a straight–through E&M or standard Category 5 LAN cable on the hardware revision B and later units.

Not Working?

Configure Ritron radio E&M jumpers to positions A, C, E for proper operation.

Ritron Jumper Settings

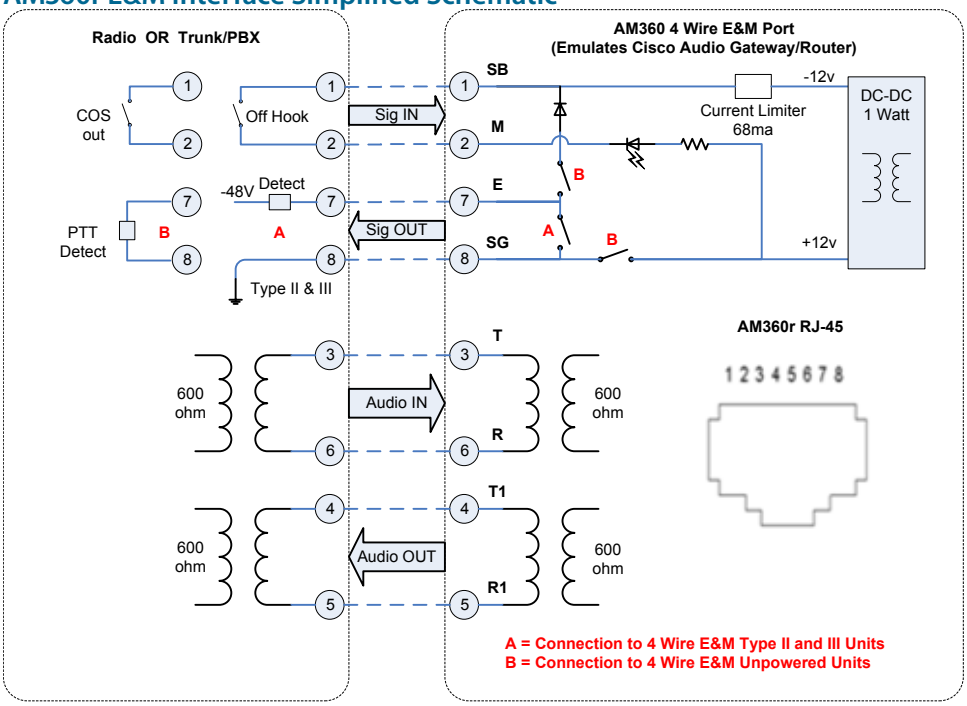
- Remove the 2 side screws and the 2 smaller bottom screws to remove the base of the Ritron radio.
- Locate the E&M daughter board and move jumpers to positions A, C, and E.
- Re-install the cover and screws.

E&M Cable

Pin Assignments

Ritron	AM360r	Wire color	Description
1	1	Orange	-12 Volts (SB)
2	2	Orange/White	COS (M-lead)
3	3	Green	Rx audio, balanced
4	4	Blue/White	Tx audio, balanced
5	5	Blue	Tx audio, balanced
6	6	Green/White	Rx audio, balanced
7	7	Brown/White	PTT to Ritron (E-lead)
8	8	Brown	Ground (SG)

AM360r E&M Interface Simplified Schematic



Motorola Waris Series

Most Motorola mobile radios in the Waris series (CM and CDM models) use the same pin-outs for basic interfacing via a 16-pin accessory connector on the rear apron. A number of the accessory pins are programmable in the radio using Motorola's closely guarded CPS programming software.

Not Working?

Proper programming of radio accessory pins is ESSENTIAL to interface with Motorola radios. CHECK ACCESSORY PIN PROGRAMMING FIRST.

Radio Programming Necessary For Use With Gateway

In almost every case where a new installation does not work as expected with a Motorola radio, the culprit is an improperly programmed accessory connector. Motorola CPS provides a number of preset configuration macros that speed this process. Look for a preset labeled "telephone interconnect", "phone patch" or similar wording. This should configure the pins of interest to do the right thing.

Pin 8 on a conventional radio must be programmed for combined PL/DPL AND COR indication; on a trunked radio select Talkgroup Activity.

Pin 11 must be programmed to provide squelched receiver audio with constant level.

Program the radio to use Pin 2 which is a mic level input to the transmitter that will provide limiting with pre-emphasis and use Pin 3 for external PTT.

Interface Cable

There are several eBay sellers offering interface cables for Motorola radios. At a minimum look for a 5-wire cable with a 16-pin accessory plug on it that fits all the CDM and CM series Motorola mobile radios.

Because some 16-pin plugs are not keyed, care must be used when inserting it into the 20-pin accessory receptacle on the CDM1550 radios, being certain to center the plug; that is, leave 2 pins bare on the left and 2 pins bare on the right so that the plug sits in the center 16 pins of the radio.

Pin Assignments

AudioMate 360r

Note: Jumper Motorola pins 15 and 16 together to enable the radio's internal speaker.

Mot	AM360r	Description
2	TXA	Transmit microphone audio to radio
3	PTT	Push-to-talk control signal to radio
7	GND	Ground, common, return
8	COS	Carrier-Operated Switch (COS, COR, RUS), receive activity indicator
11	RXA	Receive line-level audio from radio

Troubleshooting

If in doubt about the interface, a Volt meter can be used to determine if the COS input pin of the AM360r gateway changes when the attached Motorola radio is actively receiving a radio signal. It should be between 5 and 12 Volts when idle, and should drop to near 0 Volts during a received signal.

If the Voltage does not go low when the received signal is heard, then the **Motorola radio is not programmed properly** for use with a gateway. This is the #1 problem preventing proper operation of new installations. Check the accessory pin programming of the Motorola radio FIRST.

B

Appendix B Multicast Addressing Notes

Note 1: Avoid addresses of the form 224.0.0.x

Traffic to addresses of the form **224.0.0.x** is often flooded to all switch ports. This address range is reserved for link-local uses. Many routing protocols assume that all traffic within this range will be received by all routers on the network. Hence (at least all Cisco) switches flood traffic within this range. The flooding behavior overrides the normal selective forwarding behavior of a multicast-aware switch (e.g. IGMP snooping, CGMP, etc.).

Note 2: Watch for multicast address ambiguity

32 IP multicast addresses are mapped onto each Ethernet multicast address. A receiver that joins a single IP multicast group implicitly joins 31 others due to this overlap. The overlap occurs in the 5 high-order bits, so it's best to use the 23 low-order bits to make distinct multicast streams unique. For example, IP multicast addresses in the range **239.0.0.0** to **239.127.255.255** all map to unique Ethernet multicast addresses. However, IP multicast address **239.128.0.0** maps to **239.0.0.0**, **239.128.0.1** maps to **239.0.0.1**, etc.

Note 3: Avoid x.0.0.y and x.128.0.y

Combining notes 1 and 2, it's best to avoid using IP multicast addresses of the form **x.0.0.y** and **x.128.0.y** since they all map onto the range of Ethernet multicast addresses that are flooded to all switch ports.

Note 4: Watch for address assignment conflicts

IANA administers multicast addresses on the world-wide Internet. Potential conflicts with Internet multicast address assignments can be avoided by using (private) administratively scoped addresses. Such addresses can be safely used on a network connected to the Internet without fear of conflict with multicast sources originating on the Internet. Administratively Scoped addresses are roughly analogous to the unicast address space for private internets. Site-local multicast addresses are of the form **239.255.x.y**, but can grow down to **239.252.x.y** if needed. Organization-local multicast addresses are of the form **239.192-251.x.y**, but can grow down to **239.x.y.z** if needed.

The address range 239.252.1.1 through 239.255.255.254 is preferred to avoid multicast packet propogation outside of the private network.

AudioMate 360
Detailed info at:
cisco.com
29west.com
smallnetbuilder.com

» See also Cisco's Guidelines for Enterprise IP Multicast Address Allocation paper available at
www.cisco.com

» See also "Multicast Address Assignment" at
www.29west.com

» See also Doug Reid's 3 part series "Multicasting and the Small Network" at
www.smallnetbuilder.com

C

Appendix C - WAVE Configuration

WAVE (Wide Area Voice Environment) from Twisted Pair Solutions provides the glue to tie together your various IP voice communications endpoints. The AudioMate 360 family of IP voice gateways works seamlessly with WAVE to extend your communications options and enhance interoperability among disparate devices.

Multicast groups are preferred for WAVE installations to allow many soft consoles to participate in the same communication channels without increasing the bandwidth consumed by each console. Deploying multicast links to each AudioMate 360 device allows for seamless failover if that option is implemented in WAVE. Any participating media server listens to the multicast streams and picks up where the failed media server dropped off.

However, in some networks the only option is unicast transmission. This forces the AudioMate 360 units to be configured as point-to-point trunk links and prevents their streams from being picked up automatically by a failover server. In other words, if the target media server fails at the other end of the point-to-point pipe the packets have nowhere to go. As long as these limitations are acceptable, unicast point-to-point links can be employed.

Multicast Configuration

AM360

Open a web browser and point it to the management IP address of the AudioMate 360 device to be configured. Log in with user **`admin`** and password **`password`** or the credentials that you have configured.

Under Configuration click **Global**.

In the field **RTP Remote IP** type the desired multicast group address, following the guidelines in Appendix B. Addresses in the **`239.255.x.y`** block are recommended for private local area networks. For **RTP Remote Port** and **RTP Local Port** type a port number between **`16384`** and **`65534`**; both fields should be identical numbers. For **Codec** select **G.711u**; if this network segment will not support about 100kbps streams then select **GSM**. Click the button **Update Configuration** to save your changes.

WAVE

Channels (WAVE 3)

Log in to WAVE. Click **Channels** -> **Channels**, then click the **Add Channel** button. From the dropdown listbox select **Multicast Trunk**, then click the **Next** button. In the **Name** field type a meaningful name. Tab to the **Description** field and type a meaningful description. Select a group from the **Group** listbox.

In the **IP address** field type the exact same multicast group address that you configured into the AM360 above. Tab over to the **Port** field and type the exact same port number that you configured into the AM360 above. Check the box labeled **Use the same IP address and port as 'Audio Receive'**. In the **Codec** listbox select the same codec as was selected in the AM360 above; if you choose **GSM** then set the **Scale** to 1. All remaining settings may be left at their defaults.

Click the **Save** button to save your changes. If there are no other configuration changes to be entered, click the button **Commit Changes**.

Channels (WAVE 4)

Log in to WAVE. Click **Media Servers** -> **Interfaces**, then click the **Add Interface** button. From the dropdown listbox select **VoiceInterop AM360** and click the **Next** button. In the **Name** field type a meaningful name. Tab to the **Description** field and type a meaningful description.

In the **Gateway IP Address** field type the management address of the AM360 that will be associated with this endpoint. In the **RTP Remote IP address** field type the exact same multicast group address that you configured into the AM360 above. Tab over to the **RTP Remote Port** field and type the exact same port number that you configured into the AM360 above. In the **RTP Local IP address** field type the exact same multicast group address that you configured into the AM360 above. Tab over to the **RTP Local Port** field and type the exact same port number that you configured into the AM360 above.

In the **Codec** listbox select the same codec as was selected in the AM360 above; if you choose **GSM** then set the **Scale** to **1**.

Click the **Save** button to save your changes. If there are no other configuration changes to be entered, click the button **Commit Changes**.

Sessions (WAVE 3)

If you already have the desired standard user channel configured, click **Sessions** -> **Sessions**, then click the **Add Session** button.

In the dropdown listbox select **Advanced**, then click the **Next** button.

Type a meaningful name in the **Name** field. Tab to the **Description** field and type a meaningful name. Select the desired group from the **Group** listbox and click the **Save** button to reveal the full Session configuration screen.

Leave the **Conference ID / DN** field blank and clear the checkbox labeled **Treat as the Dial-In DN**. Click the **Add Servers** button and select the desired media servers that will handle this session. Click the **Add Participant** button and add the multicast trunk channel from above and the desired standard user channel that will be bridged with this AM360 device.

Click the button **Save and Commit changes**. Your AudioMate 360 device is now bridged via multicast with the desired WAVE Standard channel. Test the configuration using an AudioMate Communicator soft console.

WAVE 4

The AudioMate 360 is integrated into WAVE 4 as a media server interface. Add an AM360 to a session as an interface.

Sessions (WAVE 4)

To configure a session in WAVE version 4, proceed as directed for WAVE 3 installations. The only difference comes when adding participants to the session. After adding the standard user channel as indicated for WAVE 3, click the **Add Participant** button again. In the dropdown listbox select **VoiceInterop AM360**, then click the **Next** button. Select the desired AM360 by checking the box next to it, then click the **Add Selected Participants** button.

Unicast Configuration

AM360

Open a web browser and point it to the management IP address of the AudioMate 360 device to be configured. Log in with user `admin` and password `password` or the credentials that you have configured.

Under Configuration click **Global**.

In the field **RTP Remote IP** type the unicast address of the target media server. For **RTP Remote Port** and **RTP Local Port** type a port number between **16384** and **65534**; both fields should be identical numbers. For **Codec** select **G.711u**; if your network will not support about 100kbps streams then select **GSM**. Click the button **Update Configuration** to save your changes.

WAVE

Channels (WAVE 3)

Log in to WAVE. Click **Channels** -> **Channels**, then click the **Add Channel** button. From the dropdown listbox select **Point-to-point Trunk**, then click the **Next** button. In the **Name** field type a meaningful name. Tab to the **Description** field and type a meaningful description. Select a group from the **Group** listbox.

In the **Trunk Side A IP address** field type the IP address of the target media server. In the **Port** field type the same port number that you configured into the AM360 above.

In the **Trunk Side B IP address** field type the IP address of the AM360 above. Tab over to the **Port** field and type the exact same port number that you configured into the AM360 above. In the **Codec** listbox select the same codec as was selected in the AM360 above; if you choose **GSM** then set the Scale to 1. All remaining settings may be left at their defaults.

Click the **Save** button to save your changes. If there are no other configuration changes to be entered, click the button **Commit Changes**; else, configure Sessions as above.

Channels (WAVE 4)

Log in to WAVE. Click **Media Servers** -> **Interfaces**, then click the **Add Interface** button. From the dropdown listbox select **VoiceInterop AM360** and click the **Next** button. In the **Name** field type a meaningful name. Tab to the **Description** field and type a meaningful description.

Remote vs Local

The terms Remote and Local are relative to the device that you are configuring. In WAVE, the media server is the Local address while Remote refers to the AudioMate 360 unit.

In the **Gateway IP Address** field type the management address of the AM360 that will be associated with this endpoint. In the **RTP Remote IP address** field type the management IP address of the AM360 above. Tab over to the **RTP Remote Port** field and type the exact same port number that you configured into the AM360's field labeled 'RTP Local Port'. Leave the **RTP Local IP address** field blank to use the binding IP address of the target media server. Tab over to the **RTP Local Port** field and type the exact same port number that you configured into the AM360's field labeled 'RTP Remote Port'.

In the **Codec** listbox select the same codec as was selected in the AM360 above; if you choose **GSM** then set the **Scale** to **1**.

Click the **Save** button to save your changes. If there are no other configuration changes to be entered, click the button **Commit Changes**.

The session that bridges these unicast channels is configured in a procedure similar to bridging multicast channels in WAVE version 4.

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